

Course Name: Algebra & Analytic Geometry

Course Code: H2101 Grades: 9-10 Level: Accelerated Year: 5X Credits: 5

Course Description: Students complete their study of Algebra I while applying algebraic techniques to the study of Geometry, Statistics, and Probability. The course provides an environment where problem-solving situations motivate students to use efficient methods, deductive reasoning, and clear articulation. Students make connections between concepts which will prepare them for success in future high school courses.

Course Proficiencies: The following is a list of the proficiencies that describe what students are expected to know and be able to do as a result of successfully completing this course. The proficiencies are the basis of the assessment of student achievement. The learner will demonstrate the ability to:

1. Solve systems of equations and inequalities. Create and use system models to solve real-world problems. *A-CED.3, A-REI.5, A-REI.6, A-REI.11*
2. Use function notation and arithmetic to solve real-world problems. *F-IF.2, F-IF.5*
3. Explore the domain and range for a given function. *F-IF.1*
4. Graph and analyze quadratic functions (sketching a graph using the vertex, x-intercepts, y-intercept, symmetry, and minima/maxima). *A-SSE.3a, A-APR.3, F-IF.7a*
5. Translate a variety of real-world situations into tables, algebraic expressions, and equations/inequalities. *F-IF.9*
6. Measure and construct segments and angles. *G-CO.12*
7. Use deductive reasoning, algebraic proof, and geometric proof to verify conjectures. *G-CO.9*
8. Prove triangle congruence. *G-CO.8, G-CO.10*
9. Use dilation on the coordinate system to explore similarity of polygons. Verify similarity using the distance formula and the Pythagorean Theorem. *G-SRT.2, G-SRT.3*
10. Use the midpoint formula and properties of bisectors to establish similarity. *G-CO.10*
11. Perform transformations in the coordinate plane and explore the utility of matrices. *N-VM.6, N-VM.7, N-VM.8, G-CO.6, G-CO.5*
12. Apply the properties of special right triangles, angle pairs, triangles, and quadrilaterals. *G-CO.8, G-CO.10, G-SRT.6*
13. Solve problems in the coordinate plane involving area, perimeter, and ratios. *G-GPE.7*
14. Use volume formulas for cylinders, pyramids, cones, and spheres. *G-GMD.3*
15. Algebraically express changes in length, perimeter, area, and volume. Relate surface area to volume.
16. Develop the formula of a circle. *G-GMD.1*
17. Describe the relationship among inscribed angles, radii, and chords and apply these concepts in problem-solving situations. Examine the relationship between sector area and arc length. *G-C.2, G-C.5*
18. Use Sine, Cosine, and Tangent ratios to solve right triangle problems. *F-TF.3, G-SRT.6, G-SRT.8*

Algebra & Analytic Geometry Proficiencies – *cont'd.*

19. Analyze data using scatter plots, line of best fit, and the correlation coefficient. ***S-ID.6c, S-ID.7, S-ID.8, S-ID.9***
20. Analyze data distributions. Use Box and Whisker plots to identify quartiles of a data set.
21. Calculate the probability of independent events in a geometric context. ***S-CP.1, S-CP.2***
22. Apply mathematics in practical situations and in other disciplines.
23. Use critical thinking skills to make sense of problems, solve them, and communicate processes. ***CRP 2, 4 & 8.***
24. Use technology to gather, analyze, and communicate mathematical information. ***8.1.12.A.3***
25. Apply mathematics in practical situations and in other disciplines.
26. Use critical thinking skills to make sense of problems, solve them, and communicate processes. ***CRP 2, 4 & 8.***
27. Use technology to gather, analyze, and communicate mathematical information. ***8.1.12.A.3, 8.1.12.C.1***

Assessment: Evaluation of student achievement in this course will be based on the following:

- A. Tests
 - B. Projects
 - C. Classwork
 - D. Maintaining a folder/notebook
- A. Tests are usually given at the end of a unit. These generally require a full period to complete.
- B. During the course, special projects such as research papers, outlines, surveys, and computer-based projects may be assigned to students. These activities are major in scope. The grades on projects will count as major grades when determining the course grade.
- C. Classwork, evidenced by completed and carefully presented daily work and by the meeting of daily responsibilities, is an essential part of learning. The day-to-day work included as classwork may involve quizzes, the written results of learning activities, graded homework, and assessments of learning observed during class. The more a student is involved, the more learning that takes place.
- D. Folders/Notebooks must be maintained by students. These typically include notes and assignments kept in an organized fashion.

Board Adopted Materials:

Textbook Title: Geometry

Author: - Burger, Chard, Kennedy, Leinwand, Renfro, Roby, Seymour, & Waits

Publisher: Houghton Mifflin Harcourt Publishing Company

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